

Industrial Sector

SEP Spec

Roughly a third of U.S. energy is consumed by the industrial sector, making the sector a critical factor in our country's economic development. It is also the largest solid waste-producing sector in the nation. The United States generates 14 billion tons of industrial waste each year. The effective implementation of energy-efficient practices will improve the competitiveness of U.S.-owned companies, and also assist the nation in maintaining its global economic interests.

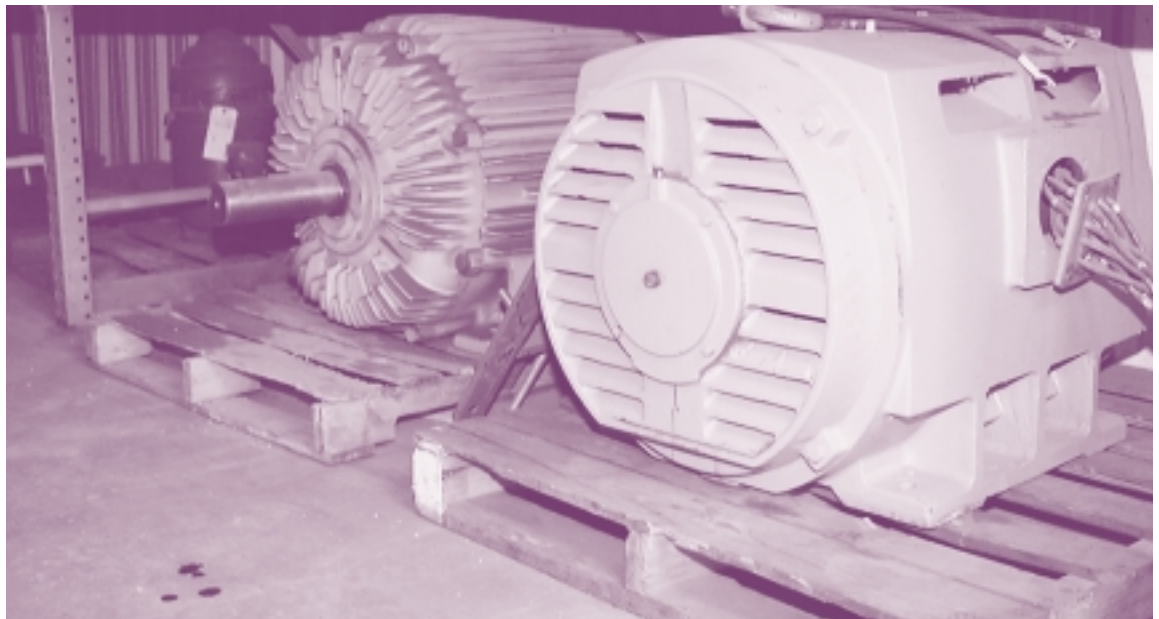
The Office of Industrial Technologies (OIT) aims to improve productivity, reduce waste, and save energy in the industrial sector through the creation of partnerships between manufacturers, government, and supporting laboratories. There is an emphasis on integrated delivery systems, which

SEP SPECIAL PROJECTS FUNDING FOR THE INDUSTRIAL SECTOR:

1996	\$2,000,000
1997	\$1,375,000
1998	\$2,480,000
1999	\$3,504,684

total:	\$9.4 million
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offer industrial clients a portfolio of energy efficiency recommendations, productivity-enhancing products, valuable services, and cutting-edge technologies. OIT supports thirty Industrial Assessment Centers nationwide, which enable small- and medium-size manufacturers to receive industrial assessments at no cost. Through SEP Special Projects, OIT has supported programs like NICE3 (National Industrial Competitiveness through Energy/Environment/Economics),



THE MOTOR CHALLENGE PROGRAM STREAMLINES THE BASIC MOTORIZED MECHANISMS OF PARTICIPATING PLANTS TO CREATE LONG-TERM ENERGY SAVINGS. THESE MOTORS IN DENVER, COLORADO, AWAIT REPAIRS WHICH WILL ALLOW FOR MORE EFFICIENT UTILIZATION IN INDUSTRIAL ENVIRONMENTS.

Special Projects Report



IMPROVEMENTS IN INDUSTRIAL STEAM SYSTEMS CAN PRODUCE SIGNIFICANT COST SAVINGS. REVIEW OF THIS PETROLEUM REFINERY'S BOILER, STEAM DISTRIBUTION, AND CONDENSATE SYSTEMS INDICATED A POTENTIAL SAVINGS OF \$1 MILLION DOLLARS.

Inventions and Innovation, and Best Practices for Motors, Steam, Compressed Air, and Combined Heat. More recently, OIT has launched SEP Special Projects for State "Industries of the Future."

A number of technologies are vital to a broad cross-section of U.S. industries and due to their widespread use, even small efficiency improvements can produce substantial energy and cost savings. These technologies include sensors and controls, combustion mechanisms, motors, heat and power sources, steam sources, and compressed air machines. The fact that these machines are operated every production day throughout the year is a testament to their savings potential.

Since nearly 70% of all electricity used in industry is consumed by some type of motor driven system, increases in the energy efficiency of existing motor systems will lead to significant nationwide energy savings. SEP Special Projects have addressed this opportunity through the implementation of the Motor Challenge Program. The main goal of the Motor Challenge Program is to work in partnership with industry to increase the market penetration of energy-efficient motor-driven systems.

Many States have found that the Motor Challenge Program is widely integrated and its energy-efficient practices eagerly adopted. The *Alabama Motor Challenge Program* has held eleven conferences in **Alabama** and





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ELECTRICITY DEREGULATION HAS OFFERED MANY OPPORTUNITIES FOR SMALL BUSINESS OWNERS IN MICHIGAN AND OHIO TO IMPROVE THEIR ENERGY EFFICIENCY AND BOTTOM LINES. THE MULTI-STATE PROJECT TO DELIVER INDUSTRY WORKSHOPS PROVIDED TARGETED INFORMATION FOR THESE CONSUMERS.

has made over 500 Motor Challenge contacts, with an estimated \$9,000 in savings per client. The program has also distributed more than 343 copies of its MotorMaster+ software to trained users and held one of the first Motor Challenge Adjustable Speed Drive seminars. Similar results were experienced in Ohio, where the *Motor Challenge Program* partnered with local utilities, leveraging \$200,000 in private funds to subsidize the \$100,000 Federal grant. The Motor Challenge Workshops provided training to almost 300 Ohioans across the State.

Another innovative technology for industry is combined heat and power systems (CHP), which can produce significant increases in fuel use efficiency as compared to conventional thermal electric plants. CHP systems also can result in major reductions in air pollutants and carbon emissions. When fully integrated with a distribution link to

multiple industrial or commercial thermal loads, efficiencies as high as 80% to 90% can be achieved.

The State of Washington's *Combined Heat and Power Project*, in partnership with Washington State University, has developed computer simulation software which provides a heat map model to assist manufacturers in realizing the technical, economic, and environmental benefits of CHP. The software also provides CHP siting criteria and has integrated the capabilities of the district's energy providers.

While each of these projects addresses specific industry needs and produces replicable models for other States, some all-inclusive projects have been created to address common regional concerns. These projects achieve success through extensive State collaboration, leveraging of funds, and on-going partnerships.

Special Projects Report



In the Midwest, **Michigan** and **Ohio** collaborated to create the *Multi-State Project to Deliver Industry Workshops*, and held five industry-wide workshops aimed at small- to medium-sized businesses and utilities. The goal was to educate these consumers of the impending electricity deregulation. The workshops emphasized the concepts of energy conservation, peak load demand reduction, cost unbundling, and time-of-use metering and billing. These practices can result in 25% to 30% cost savings for small businesses.

The *Northeast Regional Industrial Technology Collaborative* was created to promote technology exchange across industries and State lines. The partnership included seven States (**Connecticut, Maine, Massachusetts, New Hampshire, New York,**

Rhode Island, and Vermont), the Department of Energy's Boston Regional Office, three Industrial Assessment Centers, four universities, and various community organizations. The partnership was able to raise \$60,000 in private funds to reinforce the \$134,000 Special Projects grant. The Collaborative held three regional meetings to increase communication and peer exchange. These efforts resulted in daily communication between the States which broadened the collective knowledge of the staff, enhanced the delivery of services, and maximized funding resources. The partnership has generated diverse outcomes including Motor Challenge workshops, Industrial Technology workshops, an Energy Expo, and the International Energy and Environment Summit, just to name a few.

States in other regions have also recognized their shared industrial concerns and collaborated to promote energy efficiency. These collaborations between States, private companies, and institutions offer an opportunity for industry to further explore energy efficiency options. For the *Industrial Technologies Project*, Utah and Wyoming joined forces to market various energy efficiency programs, including Climate Wise, NICE3, Green Lights, Motor Challenge, and Steam Challenge. In coordination with State Energy Offices, PacificCorp, Mountain Fuel Supply, and the University of Wyoming, the project held two regional conferences and four workshops.



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INDUSTRIES OF THE FUTURE

The Industries of the Future (IOF) strategy is one of OIT's most inventive and dynamic programs. The IOF strategy targets nine energy- and waste-intensive industries, with the goal to assist those industries in reducing their energy use while improving their economic competitiveness. Industry-driven documents outlining each industry's vision for the future coupled with technology road maps to identify those technologies that offer the most significant rewards comprise the mechanisms by which the IOF strategy is executed.

The nine industries targeted by IOF are agriculture, aluminum, chemicals, forest products, glass, mining, metalcasting,

petroleum refining, and steel. As a result of the intense energy-consuming nature of these industries, they realize the greatest benefits from advances in energy efficiency technologies. The program also offers advantages to the industrial laboratories through the identification of high-risk, high-payoff technologies and the subsequent encouragement of industrial and Federal research, development, and deployment efforts.

The State of West Virginia's *Industries of the Future Project* implemented a variety of activities to achieve industrial goals. The project allowed for energy and waste assessments of the wood products industry, implemented NICE3 projects in the steel industry, hosted conferences for metal-

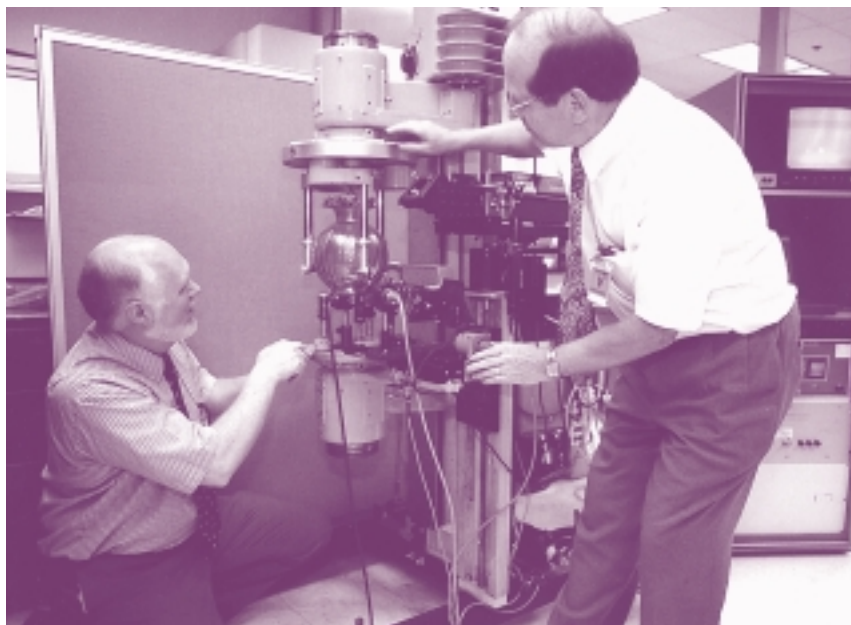


THE FOREST PRODUCTS INDUSTRY EMPLOYS MORE THAN 1.3 MILLION PEOPLE AND RANKS AMONG THE TOP 10 MANUFACTURING INDUSTRIES IN 46 STATES. THE ADOPTION OF ENERGY-EFFICIENT PRACTICES BY THIS INDUSTRY OF THE FUTURE CAN OFFER SUBSTANTIAL ENERGY SAVINGS THAT CAN BE FELT ON A NATIONAL LEVEL.

ial Projects Report



SCIENTISTS AT WEST VIRGINIA UNIVERSITY DEMONSTRATE A PROTOTYPE LASER GLASS CUTTING/FINISHING MACHINE. THE STATE IOF PROGRAM HAS PROMOTED THE USE OF THE ADVANCED MACHINES WHICH RESULT IN SUBSTANTIAL SAVINGS FOR GLASS MANUFACTURERS, BOTH BY RAISING PRODUCTIVITY AND DRAMATICALLY REDUCING WASTE.



The industrial sector comprises nearly 1/3 of U.S. energy consumption.

casting manufacturers, and evaluated energy savings in the aluminum industry. Within the State's IOF program, the West Virginia Glass Industry Technical Initiative has been particularly active. Ten conferences have been conducted, involving a cross-section of glass producers in the State, including container glass, flat glass, ceramic and china, and specialty glass manufacturers. The conferences were held to introduce the manufacturers to current advancements in their industry, such as new fiberglass waste procedures and laser glass cutting techniques.

The *Northwest Collaboration for Manufacturing Excellence* (a joint effort between **Oregon** and **Washington**) emphasized providing the States' manufacturing industries with information about the various IOF programs and the full power of IOF resources at their disposal. Through a program conducted at the Plant Engineering Show in Portland, Oregon, the collaboration educated manufacturers from a wide variety of industries in the region. These educational efforts strengthen the industries' ability to compete on both regional and global levels.